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ABSTRACT

Reasons for leaving the profession of medical technology were determined through a survey of 83 technologists' attitudes and demographic characteristics. Information was obtained on the age of respondents, year of certification, number of years experience as a medical technologist, and number of years as a member of the American Society for Medical Technology. The sample was 74.4 percent female and 25.3 percent male; the mean age of the sample was 31 years; the mean year of certification was 1972; and the mean number of years of experience as a medical technologist was 4.5 years. The sample was composed largely of baccalaureate degree people. Information was also obtained on the laboratory setting at their last place of employment, the employment capacity at last employment, current employment status, and type of employment. The data of the total study sample were divided into two groups for analysis. Data from the domestic group indicated that only factors that related to home and family responsibilities influenced their professional attrition. Data from the nondomestic group indicated that the primary factors contributing to their attrition were job-related in terms of little satisfaction of the need for self-actualization. Study results suggest that a clearer definition of the role of the medical technologist in health care delivery is needed, and that an evaluation of the educational standards for the preparation of the medical technologist be undertaken. A bibliography is appended. (SW)

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Medical Technology: Factors Contributing to Professional Attrition

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August 6, 1981

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Dear Ms. Eddy:

Please find enclosed two copies of the paper "Medical Attrition" which was presented at the 1981 meeting of the American Society for Medical Technology by Anna Marie Hajek.

Your notification of the status of this paper would be greatly appreciated.

Sincerely,

Frances J. Morris
ASMT Education Section
ERIC Coordinator

FJM/dm

cc: Anna Marie Hajek
Benita Mays, Ph.D.

Enclosure

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ABSTRACT

Despite the enormous growth the Medical Technology profession has enjoyed since World War II, it is often difficult to fill vacant positions. Evidence has indicated that this labor shortage may be concentrated at the technologist level. One means of alleviating this condition is to investigate the causes of attrition at this level. A descriptive study was designed in which 83 medical technologists, who identified themselves as dissociated from the profession, were surveyed to determine their reasons for leaving. The data of the total sample were divided into two groups for analysis. Data from the Domestic Group indicated that only factors which related to home and family responsibilities influenced their professional attrition. Data from the Non-Domestic Group indicated that the primary factors contributing to their attrition were job related in terms of deficiency of satisfaction of the need of self-actualization. The results of this study suggest that a clearer definition of the role of the medical technologist in health care delivery is needed, and that an evaluation of the educational standards for the preparation of the medical technologist be undertaken.

I. Introduction

The growth and change of the health care delivery system in this country has been the topic of many papers and studies prepared and conducted by professionals within that system, as well as those from economic and political persuasions. Included in the growth of this system is the growth in the anticipated numbers of health professionals required to maintain it.

Medical thechnology is an allied health profession experiencing a shortage of professionals even though it has enjoyed increasing numbers of these professionals since the end of World War II. This is evidenced by the fact that it is often difficult to fill vacant positions which is a "classic criterion of a labor shortage".[13]

It is difficult to know if this shortage exists at any particular level of laboratory workers because most of the reported data in the literature relate to all levels of medical technology workers: Medical Technologist, Medical Laboratory Technician, Certified Laboratory Assistant, Cytotechnologist and Histotechnologist. Jeswald, however, cites the study of Franke, et al. (1968) which indicates that the shortage may be concentrated at the technologist level.[6] This finding is supported by studies which also indicate a higher number of vacant funded positions at the medical technologist level than at the other levels within medical technology.[2,5]

There are also data which suggest that the schools of medical technology cannot provide enough graduates to meet new demands for medical technologists and to replace those lost through attrition.[14] These data, together with the opinion held by many professional medical technologist educators that applications to the schools of medical technology are declining, further establishes the reality of the technologist shortage and indicates it may worsen.

Jeswald alludes to several proposal which focus on alleviating this shortage. One which is pertinent to this study concerns tapping the number of trained, but inactive technologists for return to practice. The researcher's opinion is that a corollary to this option must be the investigation of the causes of attrition at the technologist level.

II. Definition of Terms

Professional Attrition

The purpose of this research is to serve as a descriptive study to identify those factors which influence attrition from the medical technology profession. Professional Attrition is operationally defined, in this study, as the loss of individuals from gainful employment as medical technologists. This includes those individuals who are no longer involved with the content or skills of the medical technologist practitioner, educator, or administrator as they pertain to functions within clinical, research, or industrial laboratories.

Self-actualization is a human need as described by Maslow's hierarchial theory of human needs.[8] It was operationally defined by Jeswald as the opportunity to develop new skills and knowledge; the challenge of laboratory work to the individual's abilities; the feeling of worthwhile accomplishment in the laboratory position.[6] The term is used similarly in this study.

Esteem is a human need as described by Maslow's hierarchial theory of human needs.[8] It was operationally defined by Jeswald as the feeling of self-respect obtained from the laboratory position; the prestige of the position outside the hospital (i.e. the public); the superior's appreciation of work done; the recognition given by superiors for good ideas or good work.[6] The term is used similarly in this study.

III. METHODOLOGY

Study Design

In the interest of identifying factors which influenced professional attrition from medical technology a descriptive study was designed utilizing a survey instrument. The researcher reviewed the literature and several questionnaires which had been used to survey medical technologists' attitudes and job and needs satisfaction to gather appropriate content and format information for this instrument. The survey constructed consisted of three parts.

Part I was designed to collect demographic data on the sample population and to determine the mean number of years the respondents practiced as medical technologists prior to their attrition. Part II consisted of 38 factor statements which reflected the areas of dissatisfaction for the medical technologist as described by four factor categories. Part III was incorporated to assess desire to return to the field and to identify measures which would serve as incentives for this return.

Part II of the instrument required several revisions to eliminate redundancy and yet maintain sufficient statements to describe each catagory and the desire to maintain an instrument of reasonable length. The 38 factor statements were divided among the four categories as follows: Domestic Factors, eight items; Job Related Factors subcategorized into Self-Actualization, ten items and Esteem, ten items; Profession Related Factors, seven items; Higher Education Factors, three items. Table I illustrates the content reflected by the items used for each category. The items were randomly sequenced in the survey instrument.

TABLE I

CONTENT OF ITEMS USED TO DESCRIBE CATEGORIES
IN PART II OF THE SURVEY INSTRUMENT

CATEGORY	CONTENT OF ITEMS
1. Domestic Factors	Change of life status
	Dependents, home responsibilities
	Inability to find a job as a MT
	Health reasons
	Income inadequate for support
	Husband prefers wife at home
2. Job Related Factors	
A. Self-Actualization	Chosen career actually a job
	Lack of sense of accomplishment
	Lack of responsibility commensurate with education
	Lack of opportunity to develop new skills
	Lack of challenge of the work
	Overeducation for the work
	Routine nature of the work
	Lack of career advancement potential
	Lack of continuing education opportunities
	Underutilization of knowledge and skills
B. Esteem	Lack of motivation by superiors
	Job insecurity
	Lack of input to decisions made
	Lack of credit for input to quality of patient care
	Stressful work
	Low salary
	Little recognition given by superiors
	Little prestige associated with being a MT
3. Profession Related Factors	Lack of support from the professional associations
	Lack of professional awareness among the members of the profession
	Isolation from other health care professions
	Lack of professional support from superiors
	Lack of recognition as a profession
	Lack of status of the profession
4. Higher Education Factors	MT always intended to be a temporary career
	Low salary a cause to change fields
	Continuing education necessitated leaving the field

Pilot Test of the Survey Instrument

Seven active medical technologists were asked to complete the survey instrument and indicate their time of completion. The mean time of completion was determined as 36 minutes. To assess the clarity of the instrument these seven judges were requested to comment on the survey construction that warranted changes in its format or content. To assess the factor to category congruence the judges were requested to classify the 38 factors of Part II into the four categories, which were described for them, by listing the factor number under the category that best described it. To evaluate the compatibility of the judges' classification with each other and with the researcher (a total of eight judges) and analysis of variance to estimate interjudge reliability was used.[15] The estimated reliability of the mean of the eight judges using this measurement was $r_8 = .93$.

The results of the pilot test established that the instrument was clear and understandable to those completing it, and that the time for completion was reasonable. Based on these results the survey was deemed acceptable for use in the study.

Identification of the Sample Population and Data Collection

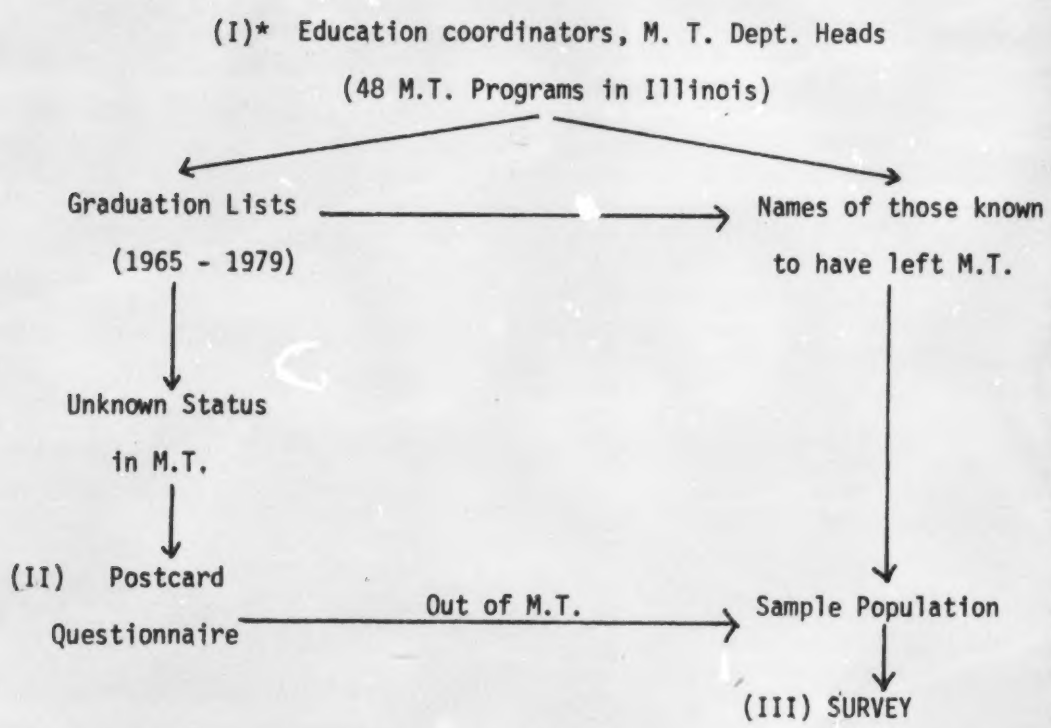
In order to maintain a homogeneous sample, the study included only medical technologists certified by the American Society of Clinical Pathologists (ASCP) who had attained ASCP certification from 1965 to 1979. Identification of the sample population was complex because records on those who have left the field are not kept by professional associations. The process utilized to accomplish the task was indirect in nature and required several mailings. Figure 1 illustrates the process used.

In the first mailing, two letters were sent to the Education Coordinator or Department Head of each of the 44 existing medical technology training programs in the State of Illinois and four such programs which had recently been discontinued. One was a letter of introduction and the second a letter requesting that the program official send the researcher a list of the names and addresses of their graduates from 1965 to 1979. The responses to this mailing varied in the information sent. Only eight of the 23 schools that responded to this request forwarded complete graduation lists. The remaining respondents forwarded the names and addresses of any graduates whom they knew had definitely left the profession or whom they questioned as still being in the profession. The responses created two groups of graduates to be contacted. One group of graduates whose status in the profession was unknown, and one group who had been identified as out of the field.

The second mailing was to the graduates of the first group who were sent a letter explaining the nature of the study and defining the term 'attrition' and a pre-stamped postcard questionnaire. The graduates were requested to complete the postcard questionnaire indicating their current status as a practitioner in the profession, and return it to the researcher. Those who returned the postcard indicating they had left the field, or would be leaving at a specified time comprised part of the recipients of the third mailing who were sent a letter explaining the study and requesting that they complete and return the enclosed

FIGURE 1

SCHEME FOR IDENTIFICATION OF STUDY SAMPLE



* Indicates number and sequence of mailings

survey.

Since the second group of graduates had been previously identified as out of the profession the preliminary postcard mailing was eliminated. These graduates comprised the remainder of the third mailing and were sent only the the letter describing the study and requesting that they participate by completing and returning the questionnaire enclosed.

The final sample population was identified by the responses to the third mailing. It was comprised of those graduates who indicated they had left the profession; those graduates who indicated they had made the decision to leave at a specified time; those graduates whom the program official had indicated as no longer in the profession. A single follow-up mailing was sent to the survey recipients three weeks after the initial surveys were mailed.

Data Analysis

The statistical computations were descriptive in nature. Frequency distribution, percentage of response and median scores were most commonly used. In addition to these statistics the mean was utilized as the measure of central tendency when interval data were available. Due to the ordinal data retrieved from the responses to the factor statements the median score was used to rank and compare the importance of the factors to the respondents.

IV. RESULTS

Response Rates on the Mailings

Table II illustrates the response rates obtained from: 1) the mailing to the program official of the schools of medical technology; 2) the postcards mailed to the graduates whose status in the profession was unknown; 3) the surveys mailed to prospective participants in the study. The response rate percentage is based on those items mailed and considered to have reached the addressee in relation to those returned to the researcher.

Table II illustrates that 23 schools of medical technology responded. Of these, one school official indicated the school would be unable to participate and two school officials indicated they were unable to release names and addresses of graduates because of school policy.

In an effort to contact the greatest number of graduates the researcher mailed the letters explaining the study, the surveys, and stamped envelopes to the school officials unable to release names and addresses of graduates and requested that they mail the surveys to their graduates meeting the study's definition of attrition themselves. The school officials were cooperative and honored this request.

Table II reports a survey response rate of 83% which is a demonstration of the willingness of the sample group to participate in this study. Of the 93 surveys returned, ten were not acceptable for analysis. Nine of these ten were rejected because the respondents did not meet the study's definition of attrition from medical technology. The remaining survey was improperly collated which necessitated its removal from the sample population. This resulted in the final sample pool of 83 surveys. Of these surveys returned, 55% included respondent's comments which is another indication of the sample group's

TABLE II

RESPONSE RATES ON MAILINGS

MAILING TO:	NUMBER SENT	NUMBER RETURNED INACCURATE ADDRESS	NUMBER RESPONSE	PERCENT RESPONSE
Schools of Medical Technology	48	---	23	48
Postcards to Graduates	451	108	186	54
Surveys to Prospective Participants	120	0	93	83

willingness to participate in this study and to convey their insights and opinions to the researcher.

Demographic Characteristics of the Sample Population

Table III presents a summary of the demographic data obtained from Part I of the survey. Table IV presents information describing the sample population in terms of age, year of ASCP certification, number of years experience as a medical technologist, and number of years as a member of the American Society for Medical Technology (ASMT).

Table III illustrates that the gender of the sample population is 74.7% female, and 25.3% male, which is consistent with the current percentages of practitioners in medical technology. Table IV shows that the mean age of the sample is 31 years, the mean year of certification as MT(ASCP) is 1972, and that the mean number of years of experience as a medical technologist is 4.5 years. Inspection of the statistical data reveals that the sample population is skewed in favor of a population which is less than 33 years of age. This is consistent with the age distribution normally associated with medical technology.

Table III illustrates that the sample is composed largely of Baccalaureate degree people. Of the sample, 26.5% are currently in school and are working toward another degree. The most common degree pursued is the Master degree, 13.3%, followed by the professional degree, 9.6%.

The professional associations that represent clinical laboratory professionals are the ASCP and the ASMT. Table III demonstrates activity in these associations by the data on ASCP registration and ASMT membership. Current ASCP registration is maintained by 74.7% of the respondents, and 51.8% of the respondents indicated they had been members of the ASMT. Table IV indicates the average length of time as an ASMT member is 2.8 years, but there is no indication that membership is ASMT

TABLE III

SUMMARY OF DEMOGRAPHIC DATA

DESCRIPTIVE CATEGORY	PERCENT RESPONSE (%)
Distribution of Respondents by sex: Female	74.7
Male	25.3
Highest education attained:	
Some college (no degree)	1.2
Associate degree (AA or AS)	0.0
Baccalaureate degree (BA or BS)	79.5
Master degree (MA, MS, MEd, MBA)	10.8
Doctorate (PhD, EdD)	2.4
Professional degree (MD, DDS, JD, LLB)	6.0
Current school status:	
Not in school	71.1
In school: Full time	12.0
Part time	16.9
Working toward a degree:	26.5
Type of degree:	
Associate degree (AA or AS)	2.4
Baccalaureate degree (BA or BS)	0.0
Master degree (MA, MS, MEd, MBA)	13.3
Doctorate (PhD, EdD)	0.0
Professional degree (MD, DDS, JD, LLB)	9.6
Other	1.2
Status of ASCP registration:	
Currently registered	74.7
Not currently registered	24.1
ASCP certification other than MT	2.4
Membership in ASMT:	
At no time a member	48.2
Student member only	13.3
Active member only	28.9
Both student and active member	9.6
Laboratory setting at last employment as a MT:	
Hospital	80.7
Clinic	7.2
Private laboratory	2.4
Research laboratory	2.4
Industrial laboratory	2.4
Other	3.6

TABLE III (Continued)

SUMMARY OF DEMOGRAPHIC DATA

DESCRIPTIVE CATEGORY	PERCENT RESPONSE (%)
Laboratory section of primary responsibility:	
Clinical Chemistry	31.3
Clinical Hematology	19.3
Clinical Microbiology	16.9
Immunohematology (Blood Bank)	7.2
Immunology	3.6
Serology	2.4
Urinalysis	0.0
General Laboratory	12.0
Other	7.3
Employment capacity at last employment:	
Staff technologist	77.1
Educator (Education Coordinator or faculty member in School of MT)	0.0
Section Supervisor	9.6
Laboratory Manager	7.2
Other	6.0
Current employment status:	
Not currently employed	33.7
Full time employment	49.4
Part time employment	13.3
More than one job	3.6
Type of employment:[a]	
In health care field	32.7
In non-health care field	61.8
Nospecification given	5.5

[a]Of those employed

TABLE IV

MEAN AND RANGE OF RESPONDENTS' AGE, YEAR OF CERTIFICATION, YEARS OF EXPERIENCE, AND YEARS AS ASMT MEMBER

DESCRIPTIVE CATEGORY	MEAN	RANGE
Age in years[a]	31	24-59
Year of MT(ASCP) Certification	1972	1965-1978
Years of experience as a medical technologist	4.5	1-14
Years as ASMT member[b]	2.8	1-14

[a] To the nearest whole number

[b] Student, Active or Both

continued after the respondents' professional attrition.

Table III also illustrates that 80.7% of the sample group were last employed as a medical technologist in a hospital setting, and 7.2% last worked in a clinic setting. Four respondents indicated the 'Other' category; three of these were employed in both a hospital and clinic, one of these indicated last employment in a hospital research laboratory. Consideration of those who last worked in a clinical laboratory. (i.e., hospital, clinical, private laboratory) setting accounts for 93% of the sample population.

Within their laboratory setting the respondents showed a wide distribution in laboratory section responsibilities. Table III illustrates that the highest percentages were shown in clinical chemistry, 31.3%, followed by clinical hematology, 19.3%, clinical microbiology, 16.9%, and general laboratory, 12.0%. Urinalysis was not considered an area of primary responsibility to the sample population, but it was indicated as part of the responsibilities of those in the general laboratory group.

Table III illustrates that 77.1% of the respondents were staff technologists during their last employment as a medical technologist. Five respondents placed themselves in the "Other" category. Their capacities were as follows: faculty in the department of medicine; combined role of staff technologist, educator, and section supervisor; assistant department supervisor; project manager.

Table III demonstrates that 66.3% of the sample group are currently employed, with 32.7% of these respondents indicating employment within health care and 61.8% of these respondents indicating employment in non-health care fields.

Factor Influence on Professional Attrition

The participants were requested to respond to each of the factor statements of Part II of the survey. The range of responses was '1' indicating Strong Influence, '2' indicating Moderate Influence, '3' indicating Weak Influence and '4' indicating Not a Factor. The higher the median score shown on the following tables the less the influence of the factor on the professional attrition of this sample population.

Total sample population data demonstrate that the most influential factors contributing to the professional attrition of the total sample population are of Category 2: Job Related Factors, specifically factors relating to the need of self-actualization. The other factor categories are not supported by these data as influencing the professional attrition of the total sample population.

Division of the total sample population into Domestic and Non-Domestic Groups was done because of two facts, first, child rearing had been cited as a factor influencing attrition from medical technology,[3] and second, the researcher noted that participants who indicated responsibility to dependents at home, Factor 7, had a strong to moderate influence on their attrition also indicated they would consider a return to the work of the medical technologist. These responses indicated that reasons unrelated to the profession may be most influential on the professional attrition of these respondents. There were 22 participants who demonstrated these responses and they were classified as the Domestic Group. The remaining 61 participants indicated that Factor 7 had either a weak influence or no influence on their professional attrition and these were classified as the Non-Domestic Group. Analysis of the Domestic and the Non-Domestic Groups was done in an attempt to confirm or reject child rearing as a factor influential on the attrition of the medical technologist, and to identify factors more indigenous to the profession which were influential in causing

professional attrition. Tables V, VI, VII, VIII illustrate the data obtained from the separate analysis of the Domestic and Non-Domestic Groups.

Domestic Group median scores of Table VIII illustrate that Domestic Factors 1, 7 and 29 are each a strong to moderate influence on the decision of this group of respondents to leave medical technology. Tables V, VI, VII, and VIII also illustrate that no other factors received a median score greater than 3.00, indicating that they had a very weak or no influence on the attrition of the respondents of this group. These data support the fact that for the Domestic Group the only factors influencing attrition relate to responsibilities to home and family and are not related to the factor categories suggested in this study.

Non-Domestic Group median scores of Tables V, VI, VII, and VIII, illustrate that several of the factors influenced the professional attrition of this group of respondents. The factors most influential on attrition were of the Job Related Factors category. Table V illustrates that 16 of the 20 factors in this category show a median score of less than 2.78 indicating some influence on attrition. The strongest contributing factor to the attrition of this group is Factor 27 (median score 1.32) which reflects frustration with lack of career advancement potential.

Table VI shows the median scores of the factors of the Profession Related Factors category. Factors 14, 24, and 36 have median scores that indicate they had moderate - weak influence on the attrition of this group. These factors address the level of recognition and status given to the profession by other health care professions and the level of professional support given to laboratorians by their supervisors, pathologists, and medical staff.

Table VII illustrates that of the Higher Education Factors category only Factor 13 could be considered to have had a moderate - weak contribution to

TABLE V

MEAN SCORE OF JOB RELATED FACTORS INFLUENCE
BY DOMESTIC AND NON-DOMESTIC GROUPS

JOB RELATED FACTORS	MEDIAN SCORE DOMESTIC	MEDIAN SCORE NON-DOMESTIC
A. Self-Actualization		
5. I felt frustrated when I realized the career I had trained for was little more than a routine job.	3.69	1.42
11. I seldom had the feeling that I was really accomplishing something worthwhile in my lab position as a MT.	3.84	2.78
16. The fact that I was performing the same tasks as those with a lesser education and training became frustrating to me.	3.80	3.04
18. I felt I had little opportunity to develop new skills and knowledge in my lab position.	3.84	2.18
20. I felt laboratory work was not challenging for me.	3.95	2.03
21. I felt I was overeducated as a MT to the extent that my training was not realistic for the actual work functions of a MT.	3.84	2.24
23. I was disenchanted with the routine of lab work	3.75	2.06
27. I felt that MT had no room for career advancement; I was in a dead end job.	3.80	1.32
28. I was seldom, if ever, allowed to attend a continuing education experience during working hours and without loss of pay.	3.88	3.35
32. I had little opportunity to utilize the knowledge of laboratory medicine I possessed once I actually began working as a MT.	3.88	2.36

TABLE V (Continued)

MEDIAN SCORE OF JOB RELATED FACTORS INFLUENCE
BY DOMESTIC AND NON-DOMESTIC GROUPS

JOB RELATED FACTORS	MEDIAN SCORE DOMESTIC	MEDIAN SCORE NON-DOMESTIC
B. Esteem		
6. I felt there was little effort made by the lab supervisors and administrators to provide me with experiences that could keep me motivated.	3.84	1.88
8. I felt my job was insecure and that I could be easily replaced.	4.00	3.90
10. I felt I had little input or effect on the decisions that were made in my lab concerning how the work was performed, i.e., the work schedule.	3.69	2.22
12. As the invisible member of the health care team I felt I was not credited with having input to the quality of patient care.	3.80	2.32
17. I felt the work of a MT was too stressful for the salary and recognition given its performance.	3.54	2.46
19. I felt my salary was too low for the training I underwent and the work I performed.	3.75	2.27
26. I felt there was little recognition given by the laboratory administrators of the good work performed.	3.75	2.31
31. I felt there was little prestige associated with being a MT.	3.88	2.73
37. I felt the laboratory supervisor had little respect for the MT bench practitioner.	3.84	3.23
38. I felt that the other hospital services gave little recognition to the laboratory for either the work performed or its personnel.	3.75	2.36

TABLE VI

MEDIAN SCORE OF PROFESSION RELATED FACTORS INFLUENCE

BY DOMESTIC AND NON-DOMESTIC GROUPS

	PROFESSION RELATED FACTORS	MEDIAN SCORE DOMESTIC	MEDIAN SCORE NON-DOMESTIC
3.	I felt the lay public knows very little about the role of the MT in health care.	3.95	3.50
4.	I felt there was a lack of professional support from the MT professional associations.	3.93	3.37
9.	The MT field is so heterogeneous in terms of levels of training and education that I found it difficult to find a true professional awareness among its members.	3.84	3.31
14.	I felt the MT profession was isolated from and unrespected by the rest of the health care professions.	3.75	2.18
24.	I felt there was a lack of professional support from the laboratory supervisors, pathologists, and the medical staff.	3.75	2.10
33.	I was tired of having to explain what a MT is and then still be called a nurse.	3.80	3.15
36.	The field did not offer the prestige or status in health care I feel I need as a professional.	3.88	2.64

TABLE VII

MEDIAN SCORE OF HIGHER EDUCATION FACTORS INFLUENCE

BY DOMESTIC AND NON-DOMESTIC GROUPS

HIGHER EDUCATION FACTORS		MEDIAN SCORE DOMESTIC	MEDIAN SCORE NON-DOMESTIC
2.	I had always intended that MT would be only a temporary profession until I realized my real career goal.	3.80	3.77
13.	I felt my income was too low and I decided to further my education as a way to enter a different profession with a higher income potential.	3.95	2.73
22.	I wanted to continue my education and had to leave the profession to do so.	3.95	3.72

TABLE VIII

MEDIAN SCORE OF DOMESTIC FACTORS INFLUENCE

BY DOMESTIC AND NON-DOMESTIC GROUPS

	DOMESTIC FACTORS	MEDIAN SCORE DOMESTIC	MEDIAN SCORE NON-DOMESTIC
1.	My life status changed and I no longer need to work.	1.46	3.95
7.	I have dependents at home whom I cannot leave. (children, disabled persons, etc.)	1.08	3.97
15.	I was unable to find a job as a MT when I finished my training.	4.00	4.00
25.	My health will not permit me to work.	4.00	3.97
29.	My family and home require my full attention.	1.08	3.96
30.	I relocated and was unable to find a job as a MT.	4.00	4.00
34.	I felt my income was too low to support myself and / or my family and I changed fields to earn a higher salary.	3.95	2.71
35.	My husband preferred that I not work outside our home.	3.54	3.98

the attrition of this group. Factor 13 addressed the issue of the income received by medical technologists. This same issue was addressed in different ways in Factor 19 of the Job Related Factors category (Table V) and Factor 34 of the Domestic Factors category (Table VIII). The median scores given to these three factors (2.73, 2.27, and 2.71 respectively) indicate that income had a moderate - weak influence on the professional attrition of the Non-Domestic Group.

Table VIII shows the median scores of the factors of the Domestic Factors category. Only Factor 34 shows a moderate - weak contribution to the attrition of this group as was discussed above. The other factors of this group had negligible influence on attrition.

It is interesting to note that Factors 15 and 30 received median scores of 4.00 by both the Domestic and Non-Domestic Groups. Both factors address job availability in the profession and for this sample population inability to find a job was not a factor contributing to their decision to leave the profession. This can be interpreted as evidence which supports the fact that vacancies at the technologist level exist, but a strict correlation to this fact cannot be made from this study.

Desire to Return to Medical Technology

In Part III of the survey a series of statements were offered to the respondents in the interest of determining what strategies might be developed to entice them, and others like them, back to the field. These strategies might also increase the attraction of the field to prospective students and increase the retention of trained technologists.

The respondents were asked to indicate if they would consider returning to the medical technology field. Those who responded affirmatively were asked to mark the statements which would provide them an incentive to return and then rank the three most important of these statements: '1' indicating Most Important, '2' indicating More Important, and '3' indicating Important.

Table IX presents the percentages of the Domestic Group, Non-Domestic Group, and total sample population who chose a particular incentive statement and the median score of that statement based on the ranking data. Statements that were not ranked by the respondents were given a value of '4'; therefore, median scores greater than '3' indicate the statement was not ranked often by the respondents and is not an important incentive to them as a group.

Table IX illustrates that none of the incentive statements offered were considered important by a majority of the Non-Domestic Group or by the total sample population. The Domestic Group scores indicate that the availability of a retraining program in current laboratory techniques would be an incentive to 86.4% of its group. This incentive statement is the only one which shows a median score within the '1' to '3' ranking system and is consistent with the fact that 100% of the respondents in this group indicated they would consider a return to the medical technology field.

TABLE IX

PERCENT CHOOSING AND RANK MEDIAN SCORE GIVEN TO INCENTIVE STATEMENTS

BY DOMESTIC GROUP, NON-DOMESTIC GROUP, AND TOTAL POPULATION

INCENTIVE STATEMENTS	DOMESTIC GROUP n= 22		NON-DOMESTIC GROUP n= 61		TOTAL POPULATION n= 83	
	%	MS	%	MS	%	MS
Financial rewards more attractive	54.5	3.85	36.1	3.79	41.0	3.81
Child care facilities made available	54.5	3.65	1.6	3.98	15.7	3.93
Increased opportunities for career advancement to more challenging position	36.4	3.95	41.0	3.75	39.8	3.82
Increased opportunites for continuing education, preferably based at the employment site	50.0	3.71	26.2	3.96	32.5	3.91
Placing a MT member on the health care team who would make patient rounds with the other team members (MD, Nurse, etc.)	13.6	3.92	26.2	3.88	22.9	3.89
MT responsibilities expanded to include patient and staff education where it concerns correct preparation for lab tests	27.3	4.00	37.7	3.95	34.9	3.96
Defined tasks within the laboratory appropriate to the level of education and training attained	40.9	3.92	29.5	3.93	32.5	3.92
Rotation through laboratory sections to use knowledge gained in training and to keep current with new practices instituted	54.5	3.81	24.6	3.91	32.5	3.89
Availability of a retraining program in current laboratory techniques for those who have been away from the field for a long period of time	86.4	2.40	31.1	3.89	45.8	3.74
Other	50.0	3.65	18.0	3.88	26.5	3.83

V. SUMMARY OF RESULTS

Of the sample population identified as having left the field of medical technology, 93 surveys were returned to give a response rate of 83%. The final sample pool was comprised of 83 surveys; 74.7% of this sample pool were female and 25.3% were male. Of those who responded 93% were last employed as a medical technologist in a clinical laboratory setting, and 66.3% indicated that they were currently employed.

Factor influence data were used to illustrate the strength of influence various factors had on professional attrition. Analysis of responses of the total sample population revealed that only two factors demonstrated strong to moderate influence on attrition. Both of these factors were of Category 2: Job Related Factors, and reflected frustration with medical technology as a career (Factor 5) and lack of career advancement potential (Factor 27). Category 1: Domestic Factors, Category 3: Profession Related Factors, and Category 4: Higher Education Factors were not supported by data as having a strong or moderate influence on the professional attrition of the total sample population.

Separation of the total sample population into Domestic and Non-Domestic Groups revealed a difference in the factors influencing the professional attrition of the respondents in each group. Data from the Domestic Group analysis indicated that only factors from Category 1: Domestic Factors that related to home and family responsibilities (Factors 1, 7, 29) influenced their professional attrition. All other data from the analysis of the Domestic Group rejected the other factor categories as being influential on the decision of these respondents to leave medical technology.

Analysis of the Non-Domestic Group indicated that the primary factors showing a strong to moderate influence on the professional attrition of the respondents in this group were from Category 2: Job Related Factors. These

factors addressed frustration with medical technology as a career (Factor 5), lack of motivating experiences provided by superiors (Factor 6), disenchantment with the routine of laboratory work (Factor 23), and lack of career advancement potential (Factor 27). Factors 2, 23, and 27 reflect a deficiency of the need of self-actualization and Factor 6 reflects a deficiency of the need of esteem. Category 1: Domestic Factors, Category 3: Profession Related Factors, and Category 4: Higher Education Factors were not supported as having a strong or moderate influence on the professional attrition of this group of respondents.

An assessment of consideration of return to medical technology by the sample was undertaken. Indication of consideration of a return was made by 68.7% of the total sample population. The divided sample demonstrated that 100% of the Domestic Group and 57.4% of the Non-Domestic Group would consider such a return.

A list of incentives to return to medical technology was presented to the respondents. While each statement of the list was chosen by some of the respondents, none of the statements was chosen by a majority of either the total sample population or by the Non-Domestic Group. One incentive statement was chosen by 86.4% of the Domestic Group, however, and this statement referred to availability of a retraining program for those who had been away from the field for a period of time.

These results indicate that several varied reasons contribute to the professional attrition of the medical technologists of this study. Some of these reasons relate to the stage of life of the respondents, i.e., child rearing, and many relate to the nature of the work of the medical technologist and the deficiency of satisfaction of needs important to the medical technologist.

VI. DISCUSSION

The field of Medical Technology has evolved more rapidly than the norm, due in part to the rapid technological advances of the post World War II era, and in part to the philosophy of this country that good quality health care services must be avialable to all.[10,12] This rapid change is evidenced by the rapid growth of the number of practitioners, as well as by the increased number of levels of specialization and the variety of the backgrounds of the practitioners within the field.[12] One of the consequences of this rapid growth may be termed an identity crisis which is causing many members of this scientific discipline to pause and ask pertinent questions of themselves and their profession.

One of these questions is the focus of this research. This study attempts to answer the question "What factor contributes to the professional attrition of trained and skilled Medical Technologists?".

Of the 38 factors listed in the survey which were potentially influential on professional attrition, it is important to note that Factors 15 and 30, which related to the availability of employemnt in the profession, were consistently rated as having no influence on professional attrition. It is also clear that none of the factors was consistently chosen as being a strong influence on professional attrition. These two results represent the extremes of the possible responses made by the study's participants. It is between these extremes that important areas that did contribute to attrition were found.

The most prominent of these areas was the Job Related Factors category which dealt with the satisfaction of the needs of self-actualization and esteem. Within this category the most influential factors reflected frustration that a chosen career was actually no more than a job (Factor 5) and that it was also a dead end job (Factor 27); these factors were followed closely by the feeling that superiors did little to motivate the respondents in their work (Factor 6).

Two other factors of this category were shown to have a moderate influence on attrition and these reflected a lack of challenge of the work (Factor 20) and a disenchantment with its routine nature (Factor 23). Consistent with this pattern, although showing a slightly less influence on attrition, were the responses to the factors which reflected that the respondents had been over-educated for the actual work they performed (Factor 21) and experienced a lack of opportunity to utilize the knowledge of laboratory medicine once they actually began working (Factor 32).

All of these factors, with the exception of Factor 6, relate to the need of self-actualization and indicate that deficiency of the satisfaction this need is most influential on professional attrition of this study's participants. In contrast, although Jeswald and Matteson, et al. found a great deficiency of satisfaction of the need of esteem, the results of this study do not indicate that the deficiency of satisfaction of this need contributes strongly to professional attrition.[6,9]

The researcher believes that the deficiency of satisfaction of the need of self-actualization is central to the identity crisis of the medical technologist. French describes self-actualization as the "development of a close fit between the concepts of the real self and the ideal self".[4] The medical technologist experiences education and training that produces an "ideal self" and then experiences a work environment where that ideal can never become a reality.

Educators of medical technologists are capable of and indeed do produce new technologists ready to perform a role in the medical and scientific milieu equal to a consultant to the physician in the areas of research and development in laboratory medicine, choice of laboratory test/s, and clinical significance of the laboratory test results obtained. Upon graduation these new technologists are met with a work environment that gives them responsibility for the production

and reporting of laboratory test results only. In light of this current utilization of medical technologists these graduates are overeducated beyond reality and into frustration.

The continual production of technologists whose potential is wasted merely results in increased attrition, as this study illustrates, and is detrimental to the profession. A resolution of this dilemma may be to re-evaluate the requirements for the baccalaureate degree in Medical Technology. The re-evaluation process should be performed under conditions which focuses the process on the primary responsibility of health professionals, i.e., patient care. These conditions would foster a climate within which the education and training of the medical technologist would be designed to meet the demands of the role of the medical technologist in providing and promoting health care.

This role of the medical technologist requires much clarification, however, and will be defined only when that role is seen in relation to other health professional roles and not as an isolated entity that impacts on patient care. The role of the medical technologist interacts with many other roles and as Lysaught relates there is a congruency, and interdependence, of these roles that should be incorporated into the role definition process.[7] A unilateral definition of the role of the medical technologist in health care can only produce an unrealistic perception of that role and create an "ideal self" with no hope of attaining self-actualization in the real work environment. This can only perpetuate the identity crisis of the medical technologist.

An example of an alternate design to the present educational process that may help to produce a more realistically trained laboratory professional is the formulation of a career ladder program for all prospective medical technologists. This would alter the present norm of a four year educational commitment to attain

a Bachelor of Science degree in Medical Technology by making entrance into the baccalaureate program contingent on the successful completion of an associate degree program for Medical Laboratory Technician and minimally two years of laboratory experience in all aspects of the laboratory. At the same time the baccalaureate educational experiences, of two years in duration, would be strengthened and channeled into scientific, educational, and administrative tracks designed to relate the role of the laboratorian to the other health professions' roles in the provision of patient care.

This type of program can provide several resolutions to conflicts within the profession and health manpower in general. First, professional awareness would be enhanced by experience in the field and those opting for the advanced degree would do so with full knowledge of the attributes and demands of the profession. Second, a career ladder concept would make career advancement a built-in mechanism. Third, educating at the technician level would provide staff practitioners well trained to produce accurate results needed for patient care, but not for a wider range of responsibilities, which would decrease frustration and foster more appropriate utilization of trained personnel based on a realistic work situation. Fourth, this concept may allow for an expansion of technician programs which would provide access to more individuals who cannot afford a four year educational commitment. Fifth, this type of program would begin to build credibility into the profession to meet the expanded role of the technologist because it would produce professionals with more concentrated education in these areas, which would be supplemented by the laboratory experience already attained.

The baccaluareate degree could then build toward higher educational degrees in specialities which would begin to place the medical technologist on a peer level with medical and other scientific practitioners. This peer recognition

is essential to give the profession the status it deserves. At this point those in the profession would have a full and exciting range of possibilities open to them.

The opinion of the researcher is that there is currently a lack of professional identity among medical technologists. This is supported by the fact that although the GELB Study found dissatisfaction with the status and recognition given to the profession among medical technologist practitioners, the Profession Related Factors category of this study did not emerge as more than weakly influential on professional attrition.[11] The characterization of medical technology as an emerging profession is accurate because in some respects the field has not reached the level of a profession. This is the reason that those factors which would normally frustrate true professionals are not strong points of dissatisfaction to this sample population.

The ASMT is striving to bring the field to professional status. Bucher and Stelling state that "the reward for success is autonomy and influence: the group is accorded the competence to define problems, determine solutions, and monitor the functioning of the system".[1] The political overtones accompanying this struggle are uncomfortable to and are often rejected by medical technologists who desire to hold to the more altruistic mores of the helping profession. However, in the arena of strong professional organizations all vying for autonomy and status the political process may be the only route to follow.

Two other areas described in the review of the literature were addressed by the study. The first of these was participation on the health care team. This was considered a strong motivator to the medical technologist, but results indicated that lack of recognition of input to this team (Factor 12) was a moderate to weak influence on attrition. Also, two incentives for return to the field addressed the health care team and were chosen by only one-third of

those who would consider a return and was not ranked as one of the top three by any of these. Secondly, information on the influence of stress of the work of the medical technologist on attrition was sought (Factor 17). While recognized as an inherent characteristic of the work, it was also shown to be a moderate to weak influence on attrition. These factors, then, did not emerge as strong reasons to leave the field.

The factors suggested by the Cohen and Korper study of pregnancy, child rearing, and return to school as causes for leaving the field obtained mixed support in this study.[3] Analysis of the separate groups within the total sample population showed strong support for the first two of these factors in the Domestic Group only, which comes as no surprise. The third factor met with mild support in the Non-Domestic Group in that their responses showed it to be a very weak influence on attrition. It appears that as reasons for leaving the field, the stage of the respondent's life was more important than the desire to change fields through further education.

The identity crisis of the profession, therefore, surfaces at many diverse points. There is confusion even among practitioners as to what comprises the work of the medical technologist. This is evidenced by the fact that several of the returned surveys were eliminated from analysis because the respondents were actually doing this work, but in a research setting rather than the clinical laboratory setting. This again indicates a clearer role definition must be found and that professional awareness is lacking.

The members of this field form disparate segments, found in this study to be differentiated by commitment to family versus commitment to career. The flexibility of the field which allows for a return by those who must, or desire to, leave for a period of time is to be applauded in light of the needs and varied aspirations of women today. The opinion of the researcher is, however, that the attributes of the field which allow for this flexibility are also those

which are found to be lacking the professional rigor sought by the more career oriented segment, i.e., intellectual and functional challenge.

If the medical technology field is to provide increasing numbers of quality health professionals it must increase its attractiveness as a profession. This will entail earnest scrutiny of the goals of the profession, the educational preparation for the profession, and the utilization of its professionals. The shortage of technologists will grow unless a role can be defined that blends with that of other health professionals and with the educational investment required. That role definition can only be facilitated through becoming a peer to those with whom medical technologists must work in the medical and scientific milieu. This will allow the medical technologist to use the professional attribute of role negotiation, described by Bucher and Stelling, with these groups in order to define themselves and to assist themselves in gaining control of the conditions impacting on the function of their role. It will be this meshing of interests and collaborative effort that ultimately will produce more highly satisfied and motivated medical technologists who have a clearly defined professional identity. The researcher believes this will attract more people to the profession as well as decrease attrition from the profession.

Implications for Further Study

There is a need for further study of the curriculum of the medical technology education programs in light of realistic roles for the technologist that show congruency with other health professions' roles. In accordance with this should be a study on the feasibility, advantages, and disadvantages of the career ladder approach to achieving the level of medical technologist. This approach would be truly innovative in health professions education and would address proper utilization of capabilities, as well as increased credibility for expanded professional roles.

A study to determine how medical technology is perceived by other professions and the public should also be conducted. Such a study may identify areas which need to be addressed by the profession in order to enhance or alter those perceptions.

Lastly, this study of professional attrition should be replicated across the nation to determine if the results presented are supported or if other areas of concern are found. It is necessary to identify common areas which influence the attrition of medical technologist practitioners and to begin to correct the problems. Taking this type of responsible action can result in the recognition of Medical Technology as a profession responsive to the needs of its members and to the patients they serve.

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